

ADVANCING POINT-OF-CARE DIAGNOSTICS



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



CSIR
Touching lives through innovation



CSIR's Human Diagnostic Platform specializes in the development of highly sensitive and specific point-of-care diagnostic assays, with a strong focus on Immunoassays and Molecular Diagnostics.

Our capability spans from concept to prototype, including:

Assay Design > Proof of Concept > Prototype Development > Validation

We offer Platform Technologies applicable to various diseases, including:

- **Human Infectious Diseases** (HIV, STIs, Malaria, TB)
- **Animal and Zoonotic Diseases** (COVID-19)
- **Food Pathogens** (Mycotoxins)
- **Waterborne Diseases** (E. coli, Cholera)

Immunoassay Development Capabilities

Lateral Flow Assays Platform:

- Rapid, user-friendly tests ideal for point-of-care settings.
- Capable of detecting antibodies, antigens, and various biomarkers.
- Applications in infectious and non-communicable disease detection, food and water-borne pathogens, and zoonotic diseases.

ELISA (Enzyme-Linked Immunosorbent Assay) Platform:

- High-throughput format for quantitative sample analysis.
- Suitable for serum, plasma, and other biological fluids.
- Extensive applications in clinical diagnostics, research, and drug development.

MOLECULAR DIAGNOSTICS CAPABILITIES

PCR (Polymerase Chain Reaction) Platform:

- Amplification of specific DNA sequences for pathogen detection and genotyping.
- Critical for infectious disease testing, genetic research, and forensic analysis.

Quantitative PCR (qPCR) Platform:

- Real-time monitoring of DNA amplification for precise quantification.
- Essential for viral load testing, gene expression analysis, and more.

TECHNOLOGIES IN DEVELOPMENT

POC Rapid Test for Early Screening of Acute Kidney Injury (AKI) in HIV Patients on ARV-Tenofovir Treatment

Problem:

- Kidney injury occurs in ~10% of patients undergoing first-line ARV therapy.
- Current tests are non-specific, provide late detection, and are lab-based.
- Impact of misdiagnosis/late detection: Treatment non-compliance, severe kidney disease, and financial burden due to treatment/hospitalization.

Stage of Development:

- Clinical Validations underway.

Onsite Aflatoxin Test Kit for Rapid Detection in Food Commodities

Problem:

- Aflatoxins pose a global health risk to humans and animals.
- Recent outbreaks of aflatoxin contamination in peanuts.
- Current tests are lab-based and imported, leading to accessibility issues.

Stage of Development:

- Field Validations underway.

INFRASTRUCTURE

Our cutting-edge laboratories and equipment enable advanced research and diagnostics, including:

- **Lateral Flow Dispensing Equipment:** Automated systems for precise test strip production.
- **Nucleic Acid Extraction Machines:** High-throughput systems for rapid and reliable DNA/RNA extraction.
- **RT-PCR Instruments:** Real-time PCR for detecting and quantifying RNA, crucial for viral diagnostics.
- **Liquid Handlers:** Automated pipetting systems that enhance assay accuracy and reproducibility.
- **Sequencers:** Advanced sequencing technologies for comprehensive genomic analysis.
- **BSL-2 and BSL-3 Laboratories:** Specialized spaces for handling infectious agents and high-risk pathogens.
- **Spectrophotometers:** Instruments for quantifying nucleic acids and proteins, essential for assay optimization.

BIOCONTAINMENT FACILITY

- Biosafety Level 2 & 3 Facilities for handling infectious samples.
- Molecular Diagnostic Facility equipped with:
 - High-throughput, automated molecular diagnostic workflows from sample preparation > extraction > analysis > results reporting.

Testing Capabilities:

- COVID-19 and Multiplex Testing for Respiratory Infections.
- Other infectious and emerging pathogens.

Collaborations & Partnerships:

- Joint project development and contract R&D.
- Access to BSL-2 and BSL-3 labs for nationwide collaborators and partners.





CONTACT US

FOR MORE INFORMATION, PLEASE CONTACT:

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**LET'S COLLABORATE AND BUILD
A SUSTAINABLE FUTURE TOGETHER!**